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(54) IMPROVEMENTS IN VALVES FOR AUTOMATICALLY REGULATING THE RATES OF FLOW OF LIQUIDS

(71) We, VAIMET OY., of Punanotkonkatu 2, Helsinki, Finland, a Finnish body corporate, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to valves for automatically regulating the flow of liquids.

One object of the present invention is to provide an improved flow rate regulating valve operating somewhat in the manner of a pressure-reducing valve governed by a control circuit, and by means of which the rate of liquid flow passing through the valve can be kept substantially constant at desired magnitude even if the pressure on the input side should vary, and which is particularly intended for use in association with individual thermal energy meters of houses or flats or dwellings connected to a communal or remote heating system in order to standardize the amount or rate of flow of hot water supplied to the respective dwellings.

In liquid distribution systems of various kinds difficulties are often encountered in connecting a branch system to a main system in such manner that fluctuations of pressure in the main system do not affect the branch system. This situation occurs e.g. in a remote heating system, where it is desired to supply a constant amount of hot water to a consumer system, which is usually a domestic system, even if the pressure produced by the pumps should be variable. For this purpose it has been common practice to install in connection with the thermal energy meters of the domestic systems various flow-limiting devices or arrangements.

Another object of the present invention is to provide a valve of high reliability in operation, so that, for instance, foreign bodies of larger or smaller size carried along by the hot water or other liquid do not have any disturbing influence on the operation of the valve.

According to the invention there is provided a valve for automatically regulating the

flow of a liquid, comprising a housing with an inlet and an outlet for the liquid, a baffle spring-loaded to throttle the flow from the inlet and movable against its spring-loading by force derived from the liquid flowing from the inlet, a bearing, a stem movably carried in the said bearing and having one end secured to and supporting the baffle, and a movable piston-like throttling member secured to the other end of said stem for variably throttling the flow to the outlet through apertures in a stationary sleeve surrounding the piston-like throttling member, all so arranged that when an increase of pressure in the inlet causes the baffle to move against its spring-loading the flow to the outlet is more strongly throttled by the piston-like throttling member and *vice versa* when a decrease of pressure in the inlet allows the baffle to move under its spring-loading the flow to the outlet is less strongly throttled by the piston-like throttling member and consequently the valve tends to keep the rate of flow substantially constant despite variations of pressure in the inlet.

The invention is defined in the Claims hereinafter, and how it may be performed is described below in greater detail with reference to the accompanying schematic drawings and to some examples of valves in accordance with the invention represented in the drawings, in which:—

Fig. 1 represents a conventional known valve which is widely used in remote heating systems,

Fig. 2 to 5 are schematic sectional views showing some alternative forms of regulating valves according to the invention, and

Fig. 6 shows graphs representing the action of a valve according to the invention.

In one widely-used known valve, shown in Fig. 1, in the outlet pipe is an orifice plate 6 and the difference Δp between the pressures on both sides of this plate 6 is used, by mediation of the pipes 1 and 2, to control the position of a diaphragm 4 of a diaphragm motor 3 which serves to actuate the valve.

[Price 25p]

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